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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/922,459
Filing Date: August 03, 2001
Appellant(s): LIN ET AL.

Seagate Technology, LLC
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/11/2006 appealing from the Office action mailed 7/13/2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The Examiner is not aware of any related appeals, interferences, or judicial proceedings, which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

Rejection under 35 USC § 103 for the following claims has been withdrawn:

Claims 9,19, 36, 62-63, 67-68, 72-73, 77, 81, 86, 91.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,633,442	Quak et al.	12-2003
6,429,984	Alex	8-2002
6,091,559	Emo et al.	7-2000

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 112

Claims 1-100 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding Claim 1, the provisional Application is silent in mentioning and/or describing how to make and use the entire procedure claimed, e.g., the step of: "writing a test pattern to a track of a magnetic disk, wherein said test pattern has higher data density than a data density of user data in said track". Appellant should note that the provisional application is merely a bunch of desired results/procedures/effects and lacks any positive enablement therein, such as found in Appellant's specification and figures 5 and 6. Hence, Claim 1 is rejected under 35 USC § 112, First Paragraph in view of lack of enablement.

Regarding Claim 11, the provisional Application is silent in mentioning and/or describing how to make and use the entire procedure claimed, e.g., the step of: "writing a test pattern to a track of a magnetic disk, wherein said test pattern has a lower data density than a data density of a user of said track". Appellant should note that the provisional application is merely a bunch of desired results/procedures/effects and lacks any positive enablement therein, such as found in Appellant's

specification and figures 5 and 6. Hence, Claim 11 is rejected under 35 USC § 112, First Paragraph in view of lack of enablement.

Regarding Claim 21, the provisional Application is silent in mentioning and/or describing how to make and use the entire procedure claimed, e.g., the step of: "identifying a sector of a magnetic disk having a magnetization that is less then average magnetization for said magnetic disk". Appellant should note that the provisional application is merely a bunch of desired results/procedures/effects and lacks any positive enablement therein, such as found in Appellant's specification and figures 5 and 6. Hence, Claim 21 is rejected under 35 USC § 112, First Paragraph in view of lack of enablement.

Regarding Claim 36, the provisional Application is silent in mentioning and/or describing how to make and use the entire procedure claimed, e.g., the step of: "wherein an amplitude of a signal derived from said test pattern in a data track of said data tracks and having a greater susceptibility to thermal decay than user data in said data transmitter by said channel". Appellant should note that the provisional application is merely a bunch of desired results/procedures/effects and lacks any positive enablement therein, such as found in Appellant's specification and figures 5 and 6. Hence, Claim 36 is rejected under 35 USC § 112, First Paragraph in view of lack of enablement.

Regarding Claim 47, the provisional Application is silent in mentioning and/or describing how to make and use the entire procedure claimed, e.g., the step of: "wherein an amplitude of a signal derived from said test pattern in said data track and having different data density in said data track than user data in said data track is transmitted by said channel..." Appellant should note that the provisional application is merely a bunch of desired results/procedures/effects and lacks any

positive enablement therein, such as found in Appellant's specification and figures 5 and 6. Hence, Claim 47 is rejected under 35 USC § 112, First Paragraph in view of lack of enablement.

Regarding Claim 56, the provisional Application is silent in mentioning and/or describing how to make and use the entire procedure claimed, e.g., the step of: "wherein an amplitude signal derived from said early warning pattern in said data track and having greater susceptibility to thermal decay than a 1T pattern in said data track is transmitted by said channel..." Appellant should note that the provisional application is merely a bunch of desired results/procedures/effects and lacks any positive enablement therein, such as found in Appellant's specification and figures 5 and 6. Hence, Claim 56 is rejected under 35 USC § 112, First Paragraph in view of lack of enablement.

Regarding Claim 61, the provisional Application is silent in mentioning and/or describing how to make and use in the Claim preamble the entire procedure claimed, e.g., the step of: "a test pattern on the track has a different data density than user data on the track". Appellant should note that the provisional application is merely a bunch of desired results/procedures/effects and lacks any positive enablement therein, such as found in Appellant's specification and figures 5 and 6. Hence, Claim 61 is rejected under 35 USC § 112, First Paragraph in view of lack of enablement.

Regarding Claim 66, the provisional Application is silent in mentioning and/or describing how to make and use in the Claim preamble the entire procedure claimed, e.g., the step of: "a test pattern on the track has a larger data density than user data on the track". Appellant should note that the provisional application is merely a bunch of desired results/procedures/effects and lacks any positive enablement therein, such as found in Appellant's specification and figures 5 and 6. Hence, Claim 66 is rejected under 35 USC § 112, First Paragraph in view of lack of enablement.

Regarding Claim 71, the provisional Application is silent in mentioning and/or describing how to make and use in the Claim preamble the entire procedure claimed, e.g., the step of: "a test

pattern to a track of a magnetic disk, wherein said test pattern has a smaller data density than a data density of a user of said track". Appellant should note that the provisional application is merely a bunch of desired results/procedures/effects and lacks any positive enablement therein, such as found in Appellant's specification and figures 5 and 6. Hence, Claim 71 is rejected under 35 USC § 112, First Paragraph in view of lack of enablement.

Regarding Claim 76, the provisional Application is silent in mentioning and/or describing how to make and use the entire procedure claimed, e.g., the step of: "a test pattern to a track of a magnetic disk wherein said test pattern has a different data density than a 1T pattern on the track". Appellant should note that the provisional application is merely a bunch of desired results/procedures/effects and lacks any positive enablement therein, such as found in Appellant's specification and figures 5 and 6. Hence, Claim 76 is rejected under 35 USC § 112, First Paragraph in view of lack of enablement.

Regarding Claim 81, the provisional Application is silent in mentioning and/or describing how to make and use the entire procedure claimed, e.g., the step of: "identifying a sector on the disk that has a greater than average susceptibility to thermal decay;" and "...wherein the test pattern has a greater susceptibility to thermal decay than any servo information and any user data on the disk..." Appellant should note that the provisional application is merely a bunch of desired results/procedures/effects and lacks any positive enablement therein, such as found in Appellant's specification and figures 5 and 6. Hence, Claim 81 is rejected under 35 USC § 112, First Paragraph in view of lack of enablement.

Regarding Claim 91, the provisional Application is silent in mentioning and/or describing how to make and use the entire procedure claimed, e.g., the step of: "identifying a sector on the disk that has a greater than average susceptibility to thermal decay;" and "shipping the disk drive from a

factory to an end user." Appellant should note that the provisional application is merely a bunch of desired results/procedures/effects and lacks any positive enablement therein, such as found in Appellant's specification and figures 5 and 6. Hence, Claim 91 is rejected under 35 USC § 112, First Paragraph in view of lack of enablement.

Regarding Claim 96, the provisional Application is silent in mentioning and/or describing how to make and use the entire procedure claimed, e.g., the step of: "selecting a test pattern from the evaluation test pattern that exhibits greatest amount of thermal decay". Appellant should note that the provisional application is merely a bunch of desired results/procedures/effects and lacks any positive enablement therein, such as found in Appellant's specification and figures 5 and 6. Hence, Claim 96 is rejected under 35 USC § 112, First Paragraph in view of lack of enablement.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1,2,4,6-8,10-11,14,16-18,47-52,61,66,71,76, are rejected under 35 U.S.C. 103(a) as being unpatentable over Alex in view of Quak et al. (US Patent No. 6, 633,442).

Regarding Claims 1 and 11, Sacks et al. teach a method for providing an early warning of thermal decay, comprising: Writing a test pattern to a magnetic disk and a location on said magnetic disk having a greater than average susceptibility to thermal decay (Col. 2, Lines 5-15 and Lines 42-43 and Col. 6, Line 1-7 and Col. 10, Lines 3-10 & lines 35-65). Alex teaches data tracks being written in

the medium and being analyzed by a test circuit, therefore, the tracks being used are tested and considered a test track with a particular test pattern being analyzed by the circuit. Alex further teaches wherein this procedure is done in an area of high areal density (i.e. data density) and wherein spontaneity degradation (for example, a location on magnetic disk having a greater susceptibility of thermal decay as claimed by the Appellant).); Measuring an amplitude of a signal produced by reading said test pattern (Col. 2, 43-44. Alex teaches that it measures the amplitude of the read- back signal.); Storing said measured amplitude (Col. 2, Lines 45-47. Alex teaches that it stores a measured fraction of the amplitude read-back signal.); Reading said test pattern to obtain an observed amplitude of a signal produced by said test signal (Col. 6, Lines 25-27); Comparing said measured amplitude to said observed amplitude (Col. 2, Lines 46-50 and Col. 3, lines 5-10; Col. 6, Lines 15-23. Alex teaches that after a certain period it re-reads the data in order to verify (i.e. compare) if the data needs to be refreshed.); And producing a thermal decay-warning signal if said comparison is unfavorable (Col. 2, Lines 49-55. Alex teaches that if the comparison falls below a certain threshold, it sends a signal to the controller indicating to switch indicating a thermal decay in order to refresh the signal. Therefore, such actions have been interpreted as a warning conditions or functions with an association of a warning signal for aborting the system to refresh the signal. See also Col. 5, Lines 7-67, wherein Alex defines its interpretation of thermal decay according to page 2, Line 11 to Page 3, Line 15 of the specification.). However, Alex does not explicitly teach wherein the tracks have differing track densities per zone. Quak et al. teaches the use of zone bit recording, in which differing data densities are recorded into different zones in order to optimize the capacity of the drive (Col. 2, L. 44 to Col. 3, L. 52 of Quak et al.). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify Alex's invention with the teaching of Quak et al. in order to achieve a desired capacity.

Regarding Claim 47, Alex teaches a hard disk drive, comprising: A base (It is a well known element to the artisan in the art that a base is a part of a drive structure (i.e. chassis)); A magnetic storage disk comprising a magnetic storage material and a plurality of data tracks (Fig. 7, Element 12); A transducer head for reading and writing information to said data tracks, wherein said information comprises at least a first test pattern, and wherein said transducer head is movable in radial direction with respect to said disk to address a selected one of said plurality of data tracks (Fig. 7, Element 43. It is obvious that a transducer moves radially throughout the disk.); A voice coil motor, interconnected to said transducer head, for moving said transducer head with respect to said data tracks (Fig. 7, Element VCM); A controller, interconnected to said voice coil motor, for controlling a position of said transducer head with respect to said data tracks (Fig. 7, Element 11 and Col. 6, Lines 46-65. The micro-controller is interconnected with the Digital Signal Processor, which is connected to the Positioning driver, which controls the position of the transducer throughout its movement.) A channel, interconnected to said transducer head, wherein an amplitude of a signal derived from said at least a first test pattern encoded in said at least a first of said plurality of data tracks and read from said at least a first of said plurality of data track is transmitted by said channel (Col. 3, Lines 5-10), and wherein a thermal decay warning signal is generated if said amplitude of said signal derived from said at least a first test pattern is less than a reference amplitude (Col. 2, Lines 49-55. Alex teaches that if the comparison falls below a certain threshold, it sends a signal to the controller indicating to switch indicating a thermal decay in order to refresh the signal. Therefore, it would have been obvious to know that some sort of signal must be sent to the apparatus to warn the occurrence of thermal decay).

Although Alex teaches determining thermal decay in a disc drive, Alex does not explicitly teach a test pattern in said data track and having a different data density in said data track than user

data in said data track. However, Quak teaches that different data can be written in different densities and in different areas (zones) on a disk. Therefore, it would have been obvious to one of ordinary skill in the art to modify the method of Alex by writing a refresh pattern having different density than the user data, as disclosed by Quak et al., in order to in order to achieve a desired capacity and furthermore, to provide another means to distinguish the refresh data from the user data.

Regarding Claims 61,66, are method claims drawn to the method of using the corresponding apparatus claimed in claims 47. Therefore method claims 61,66 are rejected for the same reasons of obviousness as discussed above.

Regarding Claim 71, has limitations similar to those treated in the rejection of Claim 47. However, Claim 71 recites: "a test pattern on the track has a smaller data density than the user data on the track," which is met by Quak et al. (Col. 2, L. 44 to Col. 3, L. 52 of Quak et al.), wherein Quak et al. teaches that different data can be written in different densities and in different areas (zones) on a disk. Therefore, it would have been obvious to one of ordinary skill in the art to modify the method of Alex by writing a refresh pattern having different (i.e. smaller) density than the user data, as disclosed by Quak et al., in order to in order to achieve a desired capacity and furthermore, to provide another means to distinguish the refresh data from the user data.

Regarding Claim 76, has limitations similar to those treated in the rejection of Claim 47. However, Claim 76 recites "a test pattern on the track has a different data density than a 1T pattern on the track." However, in Col. 2, L. 44 to Col. 3, L. 52, Quak et al. teaches that different data can be written in different densities and in different areas (zones) on a disk. Therefore, it would have been obvious to one of ordinary skill in the art to modify the method of Alex by writing a refresh pattern having different (i.e. smaller) density than the user data, as disclosed by Quak et al., in order

to in order to achieve a desired capacity and furthermore, to provide another means to distinguish the refresh data from the user data.

Regarding Claims 2, and 52, the combination of Alex and Quak et al. teaches all the limitations of Claims 1, and 47, respectively. Quak et al further teaches writing information to at least a track of said magnetic disk with a test frequency, wherein said first frequency is higher than a nominal frequency than a user data frequency (Col. 2, L. 44 to Col. 3, L. 52 of Quak et al.).

Regarding Claims 4, 14, 48, the combination of Alex and Quak et al. teaches all the limitations of Claims 1, 11, and 47, respectively. Alex further teaches identifying a sector of said magnetic disk at which a magnetic medium comprising an information storing portion of said magnetic disk is thinner than an average magnetic medium thickness of said magnetic disk, and then writing a test pattern to the sector when identified (Col. 5, Lines 7-40. Alex teaches an embodiment of its invention wherein the change the bit spacing and according to Alex, if the bit spacing is changed, the film thickness obviously changed.).

Regarding Claims 6 and 16, the combination of Alex and Quak et al. teaches all the limitations of Claims 1 and 11, respectively. Alex further teaches that in response to a thermal decay-warning signal, refreshing data stored on the magnetic disk (Col. 2, Lines 49-55. Alex teaches that if the comparison falls below a certain threshold, it sends a signal to the controller indicating to switch indicating an thermal decay in order to refresh the signal.).

Regarding Claims 7 and 17, the combination of Alex and Quak et al. teaches all the limitations of Claims 1 and 11, respectively. Alex further teaches wherein the test pattern is written to each data storage surface of each magnetic disk included in a hard drive (Col. 2, Lines 42-43 and Col. 6, Line 1-7 and Col. 10, Lines 3-10. Alex teaches data tracks being written in the medium and being analyzed by a test circuit, therefore, the tracks being used are tested and considered a test track

with a particular test pattern being analyzed by the circuit. Alex teaches in an invention one disk wherein it records at least one test pattern.).

Regarding Claims 8 and 18, the combination of Alex and Quak et al. teaches all the limitations of Claims 1 and 11, respectively. Alex further teaches wherein said steps of reading said test pattern, comparing said measured amplitude, and producing the thermal decay warning signal are performed periodically (Col. 2, Line 66 to Col. 3, Line 10).

Regarding Claim 10, the combination of Alex and Quak et al. teaches all the limitations of Claims 1, respectively. Alex further teaches that the data is written according to a longitudinal scheme (Col. 11, Lines 47-49).

Regarding Claim 49, the combination of Alex and Quak et al. teaches all the limitations of Claim 48. Alex further teaches wherein said area of said magnetic storage disk comprising data track and comprising said magnetic storage thickness is formed at a predetermined location on said magnetic storage disk. (Col. 5, Lines 7-40. Alex teaches an embodiment of its invention wherein the bit spacing is varied, and according to Alex, if the bit spacing is changed, the film thickness obviously changed. Therefore, It would have been obvious to an artisan in the art to know that if it performs an embodiment in a predetermined area of the disk.).

Regarding Claims 50 and 51, the combination of Alex and Quak et al. teaches all the limitations of Claim 49. Alex further teaches wherein said hard disk drive stores data according to a longitudinal/perpendicular recording scheme (col.11, lines 47-49), and said predetermined location is towards an inside/outside diameter of the disk. (Col. 5, Lines 7-40. Alex teaches an embodiment of its invention wherein the change the bit spacing and according to Alex, if the bit spacing is changed, the film thickness obviously changed. It would have been obvious to an artisan in the art to know that if it performs an embodiment in a predetermined area of the disk.).

4. Claims 3, 65, 70 and 75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alex and Quak et al., and further in view of Emo et al. (US Patent No. 6, 091,559).

Regarding Claim 3, the combination of Alex and Quak et al. teaches all the limitations of Claim 2. The combination does not explicitly teach wherein the track located within a first zone in the disk, said test frequency is a nominal frequency for a user data in a second zone of the disk, and the first zone is located towards an inside diameter relative to said second zone. However, this feature is well known in the art as disclosed by Emo et al., wherein it teaches a disk divided in a plurality of zones, each zone with its own recording frequency (Pat. No. 6,091,559; Col. 18, L. 20-41, Emo teaches that each zone has its own frequency in order to optimize head to disc performance when performing read/write operations.). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify the method as disclosed by Alex and Quak et al., with the teaching of Emo et al., the motivation being to order to provide different frequencies in the zones in order to optimize head to disk performance (Col. 17, Lines 53 to Col. 18, L. 41).

Regarding Claim 65, 70 and 75, the combination of Alex and Quak et al. teach all the limitations of Claims 61, 66 and 75, respectively. However, the combination does not explicitly teach wherein the disk includes the first and second zone, the track located in the first zone, and the test pattern has the same data density as user data in the second zone (Col. 18, L. 20-41. Emo teaches that each zone has its own frequency in order to optimize head to disc performance when performing read/write operations. But the overall data density in the disk is the same as mentioned in the Summary of the Invention of Emo et al.).

(10) Response to Argument

Claim Rejections - 35 USC § 112,1st Paragraph

Regarding Independent Claims 1,11,21,36,47,56,61,66,71,76,81,91,96 Appellant argues that the Examiner has not even attempted to provide an explanation as to why a person skilled in the art would not recognize that the specification provides enabling disclosure for the claims, Appellant further argues that the Examiner has confused domestic priority (which involves the provisional) with the enablement requirement (which does not involve the provisional)". The Examiner respectfully disagrees. The MPEP, section 706.02 [R-3] states "If the application properly claims benefit under 35 U.S.C. 119(e) to a provisional application, the effective filing date is the filing date of the provisional Application for any claims, which are fully supported under the first paragraph of 35 U.S.C. 112 by the provisional application" which in the instant case, the claims are not fully supported by the provisional application as discussed in the 35 USC § 112, above. Appellant refers to their provisional application (i.e. page 1, lines 33-35) to support the aforementioned limitation. Noted on lines 31-33, Appellant discloses a "transition" density higher tan the highest data pattern in the device, e.g. writing a "1T frequency of an OD zone in an ID zone. The effective transition density will be much higher than the 1T pattern of that ID zone. These lines suggest writing a frequency of one zone into a different zone. Thus, the "transition density" of the (WP) warning pattern was disclosed as a "1T frequency of an OD zone into an ID zone." This does not suggest writing a test pattern into a track wherein the test pattern has a higher data density of user data in said track." Therefore, as stated by the Examiner, the provisional application is merely a bunch of desired results/procedures/effects and lacks any positive enablement therein, such as found in Appellant's specification and figures 5 and 6. Thus, the provisional application does not satisfy the enablement requirement of 35 USC § 112, the instant application fails to comply with the 35 USC §

112, First Paragraph, enablement requirements as well. Consequently, the instant application is denied the domestic priority on the provisional. Furthermore, MPEP section 2164.05(a) [R-2] states that the specification must be enabling as of the filing date, this application claims priority of the provisional application, whose specification fails to comply with the first paragraph of 35 USC § 112 enablement requirement, and thus is not enabled as of its filing date.

Also, please note that the rejection under 35 USC § 112 was based on enablement requirement, not written description requirement, as noted by Appellant on page 20. Therefore, Appellant's arguments are considered moot.

Claim Rejections - 35 USC § 103

Upon further consideration, and in light of Appellant's arguments, filed December 11th, 2006, with respect to Claims 9,19, 36, 62-64, 67-69, 72-74, 77, 81, 86, 91, the rejection under 35 USC § 103, has been withdrawn.

Claim Rejections - 35 USC § 103- Alex in view of Quak et al.

For purposes of simplicity the rejection of similar claims and their corresponding response to arguments have been grouped together.

Appellant's argue that Quak is not proper prior art. The Examiner respectfully disagrees. In view of the rejection under 35 USC § 112, 1st Paragraph, Enablement Requirement, the Examiner denies the claimed priority date of the provisional application. Therefore, Quak et al. does qualify as prior art under 35 USC § 102 (e). See pages 14-15 of this Answer for further explanation.

Claim 61 (Group I); Claim 66 (Group IV); Claim 71 (Group VII); Claim 76 (Group X); Claims 47-51 (Group XXIII)

Appellant's arguments with respect to Claims 47,61,66,71,76 filed 12/11/2006 have been fully considered but they are not persuasive.

Regarding Claims 47,61,66, Appellant argues that Alex in view of Quak fails to teach or suggest "performing a refresh operation using a test pattern on the track that has a higher, lower, or different data density than user data on the track, much less different data density than user data track" (page 25 of Appellant's Arguments). The Examiner respectfully disagrees.

Regarding Claim 47, Alex teaches a hard disk drive, comprising: a base (It is a well known element to the artisan in the art that a base is a part of a drive structure (i.e. chassis)); a magnetic storage disk comprising a magnetic storage material and a plurality of data tracks (Fig. 7, element 12); a transducer head for reading and writing information to said data tracks, wherein said information comprises at least a first test pattern, and wherein said transducer head is movable in radial direction with respect to said disk to address a selected one of said plurality of data tracks (Fig. 7, element 43. Inherently, a transducer moves radially throughout the disk.); a voice coil motor, interconnected to said transducer head, for moving said transducer head with respect to said data tracks (Fig. 7, element VCM); a controller, interconnected to said voice coil motor, for controlling a position of said transducer head with respect to said data tracks (Fig. 7, element 11 and Col. 6, Lines 46-65; the micro-controller is interconnected with the Digital Signal Processor, which is connected to the positioning driver, which controls the position of the transducer throughout its movement.); a channel, interconnected to said transducer head, wherein an amplitude of a signal derived from said at least a first test pattern encoded in said at least a first of said plurality of data tracks and read from said at least a first of said plurality of data track is transmitted by said channel (Col. 3, Lines 5-10),

and wherein a thermal decay warning signal is generated if said amplitude of said signal derived from said at least a first test pattern is less than a reference amplitude (Col. 2, Lines 49-55. Alex teaches that if the comparison falls below a certain threshold, it sends a signal to the controller indicating to switch indicating a thermal decay in order to refresh the signal.).

Alex clearly teaches a system for reading a refresh pattern on a disk and based upon the amplitude of the read-back signal, determines if the data needs to be refreshed due to thermal decay. Alex clearly teaches comparing the refresh pattern and refreshing the data as needed. Alex does not explicitly teach a test pattern having a different data density in said data track than user data in said data track. However, Quak teaches that different data can be written in different densities and in different areas (zones) on a disk. The combination of Alex with Quak, would suggest to one of ordinary skill in the art, to have written a refresh pattern having different density than user data. The rationale would have been to achieve a desired capacity and to provide another means to distinguish the refresh data from the user data. Contrary to Appellant's arguments, there is not further connection between the density of the test refresh pattern and user data, other than the fact that they are at different densities locations. Alex, as previously stated, contains all other limitations.

Regarding Claim 71, Appellant argues that Alex in view of Quak fails to teach or suggest, "performing the refresh operation by reading a test pattern on a track that has smaller data density than user data on the track," (page 30 of Appellant's Arguments). The Examiner respectfully disagrees. Alex clearly teaches a system for reading a refresh pattern on a disk based upon the amplitude of the read-back signal, determines if the data needs to be refreshed due to thermal decay. Alex clearly teaches comparing the refresh pattern and refreshing the data as needed. Quak et al. clearly teaches that data can be recorded at different densities (smaller or higher) in different areas (zones) of the medium. The combination of Alex with Quak, would suggest to one of ordinary skill

in the art, to have written a refresh pattern having different density than user data. The rationale would have been to achieve a desired capacity and to provide another means to distinguish the refresh data from the user data. Contrary to Appellant's arguments, there is not further connection between the density of the test refresh pattern and user data, other than the fact that they are at different densities locations. Alex, as previously stated, contains all other limitations.

Regarding Claim 76, Appellant argues that Alex in view of Quak fails to teach or suggest, "performing the refresh operation by reading a test pattern on a track that has different data density than a IT pattern on the track", (page 31 of Appellant's Arguments). The Examiner respectfully disagrees. Alex clearly teaches a system for reading a refresh pattern on a disk based upon the amplitude of the read-back signal, determines if the data needs to be refreshed due to thermal decay. Alex clearly teaches comparing the refresh pattern and refreshing the data as needed. Quak et al. clearly teaches that data can be recorded at different densities (smaller or higher) in different areas (zones) of the medium. The combination of Alex with Quak, would suggest to one of ordinary skill in the art, to have written a refresh pattern having different density than user data. The rationale would have been to achieve a desired capacity and to provide another means to distinguish the refresh data from the user data. Contrary to Appellant's arguments, there is not further connection between the density of the test refresh pattern and user data, other than the fact that they are at different densities. Alex, as previously stated, contains all other limitations.

Claims 1, 6-8 and 10 (Group XII); Claims 11, 16-18 and 20 (Group XV)

Appellant's arguments with respect to Claims 1,11, and 20 filed 12/11/2006 have been fully considered but they are not persuasive.

Regarding Claims 1,11, and 20 Appellant argues that Alex in view of Quak fails to teach or suggest "performing a refresh operation using a test pattern on the track that has a higher, lower, or different data density than user data on the track, much less different data density than user data track" (page 37 of Appellant's Arguments). The Examiner respectfully disagrees.

Regarding Claims 1,11, and 20, Alex teaches a method for providing an early warning of thermal decay, comprising: Writing a test pattern to a magnetic disk and a location on said magnetic disk having a greater than average susceptibility to thermal decay (Col. 2, Lines 5-15 and Lines 42-43 and Col. 6, Line 1-7 and Col. 10, Lines 3-10 & lines 35-65). Alex teaches data tracks being written in the medium and being analyzed by a test circuit, therefore, the tracks being used are tested and considered a test track with a particular test pattern being analyzed by the circuit. Alex further teaches wherein this procedure is done in an area of high areal density (i.e. data density) and wherein spontaneity degradation (for example, a location on magnetic disk having a greater susceptibility of thermal decay as claimed by the Appellant).); measuring an amplitude of a signal produced by reading said test pattern (Col. 2, 43-44. Alex teaches that it measures the amplitude of the read- back signal.); storing said measured amplitude (Col. 2, Lines 45-47. Alex teaches that it stores a measured fraction of the amplitude read-back signal.); reading said test pattern to obtain an observed amplitude of a signal produced by said test signal (Col. 6, Lines 25-27); comparing said measured amplitude to said observed amplitude (Col. 2, Lines 46-50 and Col. 3, lines 5-10; Col. 6, Lines 15-23. Alex teaches that after a certain period it re-reads the data in order to verify (i.e. compare) if the data needs to be refreshed.); and producing a thermal decay-warning signal if said comparison is unfavorable (Col. 2, Lines 49-55. Alex teaches that if the comparison falls below a certain threshold, it sends a signal to the controller indicating to switch indicating a thermal decay in order to refresh the signal. Therefore, such actions have been interpreted as warning conditions or functions with an

association of a warning signal for aborting the system to refresh the signal. See also Col. 5, Lines 7-67, wherein Alex defines its interpretation of thermal decay according to page 2, Line 11 to Page 3, Line 15 of the specification.).

Alex clearly teaches a system for reading a refresh pattern on a disk based upon the amplitude of the read-back signal, and determines if the data needs to be refreshed due to thermal decay. Alex clearly teaches comparing the refresh pattern and refreshing the data as needed. Alex does not explicitly teach a test pattern having a different data density in said data track than user data in said data track. However, Quak teaches that different data can be written in different densities and in different areas (zones) on a disk (Col. 2, L. 44 to Col. 3, L. 52 of Quak et al.). The combination of Alex with Quak, would suggest to one of ordinary skill in the art, to have written a refresh pattern having different density than user data. The rationale would have been to achieve a desired capacity and to provide another means to distinguish the refresh data from the user data. Contrary to Appellant's arguments, there is not further connection between the density of the test refresh pattern and user data, other than the fact that they are different densities. Alex, as previously stated, contains all other limitations. Thus, Quak clearly provides the missing limitations and is properly combinable with Alex, as both Quak and Alex are inventions that deal with adjusting the data density in the data storage device to increase data storage capacity.

Claim 4 (Group XIII); Claim 14 (Group XVI)

Appellant's arguments with respect to Claims 4 and 14 filed 12/11/2006 have been fully considered but they are not persuasive.

Regarding Claims 4 and 14, Appellant argues that "Alex fails to teach or suggest performing the refresh operation by identifying a sector of the disk at which the magnetic medium is thinner

than average and then writing the user data to the sector in response to the identification (page 38 of Appellant's Argument)." The Examiner respectfully disagrees.

Alex teaches identifying a sector (fig.7 & col.7, lines 48-50) of said magnetic disk at which a magnetic medium comprising an information storing portion of said magnetic disk is thinner than an average magnetic medium thickness of said magnetic disk, and then writing a test pattern to the sector when identified (Col. 5, Lines 7-40. Alex teaches an embodiment of its invention wherein the change the bit spacing and according to Alex, if the bit spacing is changed, the film thickness obviously changed.).

Claim 52 (Group XXIV)

Appellant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Claim Rejections - 35 USC § 103- Alex in view of Quak et al., further in view of Emo et al.

For purposes of simplicity the rejection of similar claims and their corresponding response to arguments have been grouped together.

Appellant's argues that Quak is not proper prior art. The Examiner respectfully disagrees. In view the rejection under 35 USC § 112 1st Paragraph, Enablement Requirement, the Examiner denies the claimed priority date of the provisional application. Therefore, Quak et al. does qualify as prior art under 35 USC § 102 (e). See pages 13-14 of this Answer for detailed explanation.

Claim 3 (Group IV); Claim 65 (Group I); Claim 70 (Group II); Claim 75 (Group III)

Appellant's arguments with respect to Claims 3,65,70,71 filed 12/11/2006 have been fully considered but they are not persuasive.

Regarding Claims 3,65,70,75 Appellant argues that Alex in view of Quak, further in view of Emo, fails to teach or suggest "performing the refresh operation by reading a test pattern on a track in a first zone on the disk that has different data density than user data on the track, much less the test pattern has the same data density as user data in a second zone on the disk" (page 62 of Arguments). The Examiner respectfully disagrees.

Alex and Quak discloses al the limitations of parent claim 61, but fails to specifically disclose wherein the disk includes the first and second zone, the track located in the first zone, and the test pattern has the same data density as user data in the second zone. However, Emo et al. is relied for disclosing a medium wherein the data density is constant within the different zones (Col. 18, L. 20-41). Emo teaches that each zone has its own frequency in order to optimize head to disc performance when performing read/write operations. But the overall data density in the disk is the same as mentioned n the Summary of the Invention of Emo et al.). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify the method as disclosed by Alex and Quak et al., by providing the same density within different zones as disclosed by Emo et al. in order to optimize head to disk performance (Col. 17, Lines 53 to Col. 18, L. 41).

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Dismery Mercedes

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